

CLAIMS

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1 1. A package divert mechanism, comprising:
2 a frame member adapted for use with an existing conveyor system
3 for transporting an item in an original direction; and
4 a moveable diverting mechanism extending from the frame
5 member, the moveable diverting mechanism being movable in at least one
6 direction substantially perpendicular to the original direction of travel of
7 the item being transported on the existing conveyor system.

1 2. The package divert mechanism of claim 1, wherein:
2 the moveable diverting mechanism is a bi-directional moveable
3 diverting mechanism;
4 the at least one direction is a first direction and a second opposing
5 direction, both substantially perpendicular to the original direction of
6 travel of the item; and
7 the moveable bi-directional diverting mechanism is capable of
8 diverting the item to either the first direction or the second opposing
9 direction.

1 3. The package divert mechanism of claim 1, wherein the
2 moveable diverting mechanism remains stationary so that a item can pass
3 therethrough.

1 4. The package divert mechanism of claim 1, wherein the
2 moveable diverting mechanism includes a downward extending blade
3 having a first surface and a second surface and a longitudinal axis, the first
4 and second surface facing opposing directions substantially perpendicular
5 to the original direction of travel of the item and the longitudinal axis is
6 substantially parallel to the original direction of travel of the item.

1 5. The package divert mechanism of claim 1, wherein the
2 moveable diverting mechanism further includes a moving mechanism for
3 moving the moveable diverting mechanism.

1 6. The package divert mechanism of claim 5, wherein the moving
2 mechanism includes an actuator and a gliding mechanism.

1 7. The package divert mechanism of claim 6, further comprising a
2 frame member of the frame and a mounting mechanism of the moveable
3 diverting mechanism, the gliding mechanism extending from the frame
4 member and connected to the mount of the moveable diverting
5 mechanism.

1 8. The package divert mechanism of claim 5, further comprising an
2 over current sensor for determining whether a current associated with the
3 actuator exceeds a threshold limit.

1 9. The package divert mechanism of claim 1, further comprising a
2 plurality of sensors associated with the moveable diverting mechanism.

1 10. The package divert mechanism of claim 9, wherein the
2 plurality of sensors include:

3 at least one home sensor for detecting a home position of the
4 moveable diverting mechanism;

5 at least one over travel sensor for detecting an over travel
6 position of the moveable diverting mechanism; and

7 at least one photosensor for detecting a flow of the items.

1 11. The package divert mechanism of claim 1, further comprising
2 momentary contacts which provide an input signal to control the
3 movement of the moveable diverting mechanism.

1 12. The package divert mechanism of claim 1, further comprising
2 hoods having openings, the hoods being positioned at an entrance and
3 each exit of the frame.

1 13. The package divert mechanism of claim 12, further
2 comprising at least one interlock switch for detecting a position of the
3 hoods and providing a signal to a controller for shutting down movement
4 of the moveable diverting mechanism when any of the hoods are in an
5 upright position.

1 14. A bi-directional divert mechanism, comprising:
2 a frame having an entrance and a plurality of exits:
3 a gliding mechanism extending across a frame member of the
4 frame and adapted to move between opposing exits of the plurality of
5 exits;
6 a downward extending moveable blade member coupled to the
7 gliding mechanism, the downward extending blade member having
8 opposing blade surfaces and a longitudinal axis, the opposing blade

9 surfaces facing opposing exits and the longitudinal axis extending in a
10 direction between the entrance and another of the exits.

1 15. The bi-directional divert mechanism of claim 14, further
2 comprising a series of sensors for monitoring or controlling actions of the
3 downward extending moveable blade member.

1 16. The bi-directional divert mechanism of claim 15, wherein the
2 series of sensors includes at least one of:

3 at least one home sensor for detecting a home position of the
4 downward extending moveable blade member;

5 at least one over travel sensor for detecting an over travel position
6 of the downward extending moveable blade member;

7 at least one photosensor for detecting a flow of items;

8 an over current sensor for determining whether a current associated
9 with an actuator of the downward extending moveable blade member
10 exceeds a threshold limit; and

11 momentary contacts which provide an input signal to control the
12 movement of the downward extending moveable blade member.

1 17. The bi-directional divert mechanism of claim 14, further
2 comprising a safety hood positioned at least at one of the entrance and
3 exits of the frame.

1 18. A method of diverting an item, comprising the steps of:
2 locating a first home position and a second home position of a
3 diverting mechanism;

4 positioning the diverting mechanism at one of the first home
 5 position and the second home position;
 6 determining a diverting direction of the item based on
 7 classification information associated with the item; and
 8 controlling the diverting mechanism in accordance with the
 9 diverting direction.

1 19. The method of claim 18, wherein the controlling step includes:
 2 moving the diverting mechanism in a first direction in order to
 3 divert the item in the first direction which is substantially perpendicular to
 4 an original direction of travel of the item;
 5 moving the diverting mechanism in a second direction opposite the
 6 first direction;
 7 allowing the diverting mechanism to remain stationary in order to
 8 allow the item to pass through unimpeded.

1 20. The method of claim 19, further comprising the step of
 2 determining and allocating a new home position of the diverting
 3 mechanism after the controlling step.

1 21. The method of claim 18, further comprising the step of
 2 suspending movement of the diverting mechanism based on at least one
 3 of:
 4 a detection of an item being jammed;
 5 a detection of an item exceeding a threshold physical characteristic
 6 limit;
 7 a detection that the diverting mechanism exceeds a travel limit; and

1 a detection that an operator has open access to the diverting
2 mechanism.

1 22. The method of claim 21, wherein the step of the detection of
2 the jammed item and the detection of the item exceeding a threshold
3 physical characteristic limit is based on a detection of an over current of
4 an actuator which moves the diverting mechanism.